In the Claims

Please amend the claims as follows:

1. (Currently Amended) A ~~hand-held~~ tool for evaluating a fitting assembly of the type having a conduit ~~and a fluid coupling installed thereon~~ assembled at one end to a fitting comprising a body, a nut, and at least one ferrule, the tool comprising:

a source adapted to apply mechanical energy ~~waves~~ into the ~~fitting assembly~~ conduit; said source receiving reflected energy ~~waves~~ and producing a signal related thereto; and

an analyzer that determines a characteristic of an end portion of the conduit within the fitting ~~assembly~~ as a function of said signal ~~reflected portions of said energy waves~~.

2. (Original) The tool of claim 1, wherein the source is integrated with a gap gauge.

3. (Original) The tool of claim 1, wherein the analyzer is integrated with a gap gauge.

4. (Original) The tool of claim 1, wherein said tool includes a gap gauge and an ultrasonic analyzer.

5. (Original) The tool of claim 1, wherein said source comprises a separate transmitter and receiver.

6. (Original) The tool of claim 1, wherein said source produces transient shear ultrasonic energy waves.

7. (Currently Amended) The tool of claim 1, wherein said analyzer correlates said received energy ~~waves~~.

8. (Original) The tool of claim 7, wherein said correlation is based on a Morlet wavelet correlation function.

9. (Currently Amended) The tool of claim 1, wherein said energy is ~~waves are~~ applied to the ~~a~~ fitting body ~~that is associated with the fluid coupling~~.

10. (Original) The tool of claim 1, wherein said energy waves are applied to the conduit at an angle within the range of about greater than 0° to about 90° from normal relative to a longitudinal axis of the conduit.

11. (Currently Amended) The tool of claim 1, wherein said characteristic relates to bottoming of an end of the conduit against a shoulder in the fitting body~~fluid coupling~~.

12. (Currently Amended) The tool of claim 10, wherein said source is adapted to apply energy ~~waves are input~~ at two or more different locations about the conduit, said source producing a plurality of electrical signals in response to said received energy ~~waves~~, each electrical signal corresponding to a respective one of said locations.

13. (Original) The tool of claim 12 comprising a correlation function of said plurality of electrical signals and wherein said analyzer produces an output that corresponds to axial position of an end of the conduit based on said correlation.

14. (New) The tool of claim 1, further comprising a base adapted to align with a surface of the fitting.

15. (New) The tool of claim 14, wherein the base is provided with a mating surface that conforms to a outer surface of the conduit.

16. (New) The tool of claim 14, wherein the base comprises a low attenuation plastic.

17. (New) The tool of claim 14, wherein the base comprises an acrylic resin.

18. (New) The tool of claim 1, wherein the source is adapted to be positioned relative to a reference position of the fitting.

19. (New) The tool of claim 18, wherein said characteristic relates to the relative axial position of the end of the conduit, relative to the reference position of the fitting.

20. (New) The tool of claim 19, wherein the analyzer is adapted to compare the relative axial position of the end of the conduit, relative to the reference position of the fitting, to corresponding test data for a properly installed fitting assembly.

21. (New) The tool of claim 1, wherein said characteristic relates to the quality of contact between the end of the conduit and an internal surface of the fitting body.

22. (New) The tool of claim 21, wherein the quality of contact characteristic is selected from a group consisting of: contact surface area between conduit end and fitting body surface, load between conduit and fitting body surface, gap between conduit end and fitting body surface, and square alignment of conduit end and fitting body surface.

23. (New) The tool of claim 1, wherein said characteristic relates to the relative axial position of an impression in the conduit formed by the at least one ferrule assembled to the conduit, relative to a position of the source.

24. (New) The tool of claim 1, wherein said characteristic relates to the presence of an impression in the conduit formed by the at least one ferrule assembled to the conduit.

25. (New) The tool of claim 1, wherein said analyzer is adapted to compare said characteristic to a corresponding characteristic related to a properly assembled fitting assembly.

26. (New) A method for evaluating a pulled-up condition of a fitting assembly of the type having a conduit assembled at one end to a fitting comprising a body, a nut, and at least one ferrule, the method comprising the steps of:

applying mechanical energy into the conduit at a predetermined reference position;

detecting at said reference position reflected mechanical energy; and

determining a characteristic of an end portion of the conduit as a function of said reflected mechanical energy.

27. (New) The method of claim 26, wherein the step of applying mechanical energy into the conduit at a predetermined reference position includes the step of positioning a source of the mechanical energy against a reference fitting surface.

28. (New) The method of claim 26, wherein the step of applying mechanical energy into the conduit at a predetermined reference position includes the step of positioning a source of the mechanical energy against a face of the nut.

29 (New) The method of claim 28, further comprising the step of tightening the fitting to a pulled-up condition.

30. (New) The method of claim 26, wherein said characteristic relates to the relative axial position of the conduit end, relative to the predetermined reference position.

31. (New) The method of claim 30, further comprising the step of comparing the relative axial position of the conduit end, relative to the predetermined reference position, to corresponding test data for a properly installed fitting assembly.

32. (New) The method of claim 26, wherein said characteristic relates to the quality of contact between the end of the conduit and an internal surface of the fitting body.

33. (New) The method of claim 32, wherein the quality of contact characteristic is selected from a group consisting of: contact surface area, load between conduit and fitting body surface, gap between conduit end and fitting body surface, and square alignment of conduit end and fitting body surface.

34. (New) The method of claim 26, wherein said characteristic relates to the relative axial position of an impression in the conduit formed by the at least one ferrule assembled to the conduit, relative to the predetermined reference position.

35. (New) The method of claim 26, wherein said characteristic relates to the presence of an impression in the conduit formed by the at least one ferrule assembled to the conduit.

36. (New) The method of claim 26, further comprising the step of comparing said characteristic to a corresponding reference characteristic relating to a properly assembled fitting assembly.

37. (New) The method of claim 26, further comprising the step of installing the fitting to the end of the conduit prior to applying mechanical energy.

38. (New) The method of claim 26, further comprising the step of tightening the fitting assembly prior to applying mechanical energy.

39. (New) The method of claim 27, further comprising the step of applying a low attenuation coupling material between said source and said fitting assembly.

40. (New) The method of claim 26, wherein the step of applying mechanical energy comprises applying mechanical energy to the conduit at a plurality of locations.

41. (New) The method of claim 40, wherein reflected portions of said energy is received at a plurality of locations to produce a plurality of signals related thereto.

42. (New) The method of claim 41, wherein said characteristic is determined using a correlation function of said plurality of signals.

43. (New) An apparatus for evaluating a fluid coupling connection, the apparatus comprising:

a fitting, comprising a first component, a second component and at least one conduit gripping device;

a conduit assembled to said fitting to form a fitting assembly; and

a tool for evaluating the fitting assembly, the tool comprising a source adapted to apply mechanical energy into the conduit; a receiver adapted to detect reflected energy and produce a signal related thereto; and an analyzer that determines a characteristic of the conduit end within the fitting as a function of said signal.

44. (New) The apparatus of claim 43, wherein said source comprises a separate transmitter and receiver.

45. (New) The apparatus of claim 43, wherein said source is adapted to produce transient shear ultrasonic energy waves.

46. (New) The apparatus of claim 43, wherein said analyzer is adapted to correlate said received energy waves.

47. (New) The apparatus of claim 46, wherein said correlation is based on a Morlet wavelet correlation function.

48. (New) The apparatus of claim 43, wherein the tool is adapted to apply said energy to the first component of the fitting.

49. (New) The apparatus of claim 43, wherein the tool is adapted to apply said energy waves to the conduit at an angle within the range of about greater than 0° to about 90° from normal relative to a longitudinal axis of the conduit.

50. (New) The apparatus of claim 43, wherein said characteristic relates to bottoming of an end of the conduit in the fitting.

51. (New) The apparatus of claim 43, wherein the tool is adapted to apply energy at two or more different locations about the conduit, said source producing a plurality of electrical signals in response to said received energy waves, each electrical signal corresponding to a respective one or said locations.

52. (New) The apparatus of claim 51 wherein the tool is adapted to perform a correlation function of said plurality of electrical signals and wherein said analyzer produces an output that corresponds to an axial position of an end of the conduit based on said correlation.

53. (New) The apparatus of claim 43, wherein the tool further comprises a base adapted to align with a surface of the fitting.

54. (New) The apparatus of claim 53, wherein the base is provided with a mating surface that conforms to an outer surface of the conduit.

55. (New) The apparatus of claim 53, wherein the base comprises a low attenuation plastic.

56 (New) The apparatus of claim 53, wherein the base comprises an acrylic resin.

57. (New) The apparatus of claim 43, wherein the source is adapted to be positioned at a reference position of the fitting.

58. (New) The apparatus of claim 57, wherein said characteristic relates to the axial separation between the reference position of the fitting and an end of the conduit.

59. (New) The apparatus of claim 58, wherein the analyzer is adapted to compare the relative axial position of between the end of the conduit, relative to the reference position, to corresponding test data for a properly installed fitting assembly.

60. (New) The apparatus of claim 43, wherein said characteristic relates to the quality of contact between the end of the conduit and an internal surface of the fitting.

61. (New) The apparatus of claim 60, wherein the quality of contact characteristic is selected from a group consisting of: contact surface area between conduit end and fitting surface, load between conduit and fitting surface, gap between conduit end and fitting surface, and square alignment of conduit end and fitting surface.

62. (New) The apparatus of claim 43, wherein said characteristic relates to the relative axial position of an impression in the conduit formed by the at least one conduit gripping device assembled to the conduit, relative to the reference position.

63. (New) The apparatus of claim 43, wherein said characteristic relates to the presence of an impression in the conduit formed by the at least one conduit gripping device assembled to the conduit.

64. (New) The apparatus of claim 43, wherein said analyzer is adapted to compare said characteristic to a corresponding characteristic related to a properly assembled fitting assembly.

65. (New) The apparatus of claim 43, wherein said source and receiver are a single device.